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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/754,572	01/12/2004	Mun-Pyo Hong	6192.0158D1	8242
7590	06/01/2005		EXAMINER	
McGuireWoods LLP Suite 1800 1750 Tysons Blvd. McLean, VA 22102			FENTY, JESSE A	
			ART UNIT	PAPER NUMBER
			2815	

DATE MAILED: 06/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/754,572

Applicant(s)

HONG ET AL.

Examiner

Jesse A. Fenty

Art Unit

2815

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 09 March 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 10-15 and 45-54 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 10-15 and 45-54 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date: \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 10, 11, 13, 15, 45-47, 51, 52 and 54 are rejected under 35 U.S.C. 102(e) as being anticipated by Kaneko et al. (U.S. Patent No. 6,433,842 B1).

In re claim 10, Kaneko (esp. Fig. 1) discloses a semiconductor device, comprising:

a wire (8) of a conductive material on a substrate (1);

an inter-layer reaction layer (9) formed on the wire and including at least silicon or transition metal (molybdenum); and

a conductive layer (11) electrically connected to the wire via the inter-reaction layer.

In re claim 11, Kaneko discloses the device of claim 10, wherein the wire is made of a conductive material including aluminum-based material (column 9, line 63).

In re claim 13, Kaneko discloses the device of claim 10, wherein the inter-layer reaction layer is an inter-metallic compound layer.

In re claim 15, Kaneko discloses the device of claim 10, further comprising an insulating layer (10) having a contact hole exposing the inter-layer reaction layer between the wire and the conductive layer.

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In re claim 45, Kaneko (esp. Fig. 1) discloses a semiconductor device, comprising:

- a gate wire (2) made of a first conductive material on an insulating substrate;
- a gate insulating layer (4) covering the gate wire;
- a semiconductor layer (5) formed on the gate insulating layer;
- a data wire (8) made of a second conductive material on the gate insulating layer and the semiconductor layer;
- a passivation layer (10) covering the data wire;
- an inter-layer reaction layer (9) formed on the gate wire and the data wire; and
- a transparent conductive layer (11) pattern electrically connected to the data wire through a first contact hole of passivating layer via the first contact hole;

wherein the transparent conductive pattern is electrically connected to data wire via the inter-reaction layer.

In re claim 46, Kaneko discloses the device of claim 45, wherein the first (column 7, lines 35-37) and second (column 9, line 63) conductive material include a metal of aluminum-based material.

In re claim 47, Kaneko discloses the device of claim 45, wherein the insulating layer (column 7, line 48) and the passivation layer (column 8, lines 34-35) are made of silicon nitride.

In re claim 50, Kaneko discloses the device of claim 45, wherein the inter-layer reaction layer includes a transition metal (molybdenum).

In re claim 51, Kaneko discloses a semiconductor device, comprising:

- a first wire (8) formed of a conductive material; and
- a second wire formed on and in contact with the first wire, the second wire comprising:

a first conductive layer (11) formed of a conductive material; and  
a second conductive layer (9) sandwiched between the first wire and the first conductive layer and containing a transition metal (molybdenum),  
wherein the first conductive layer is electrically connected to the first wire via the second conductive layer.

In re claim 52, Kaneko discloses the device of claim 51, wherein the first wire contains aluminum.

In re claim 54, Kaneko discloses the device of claim 51, wherein the first conductive layer is formed of a transparent conductive material (indium tin oxide).

### *Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 49 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kaneko (as above).

In re claim 49, Kaneko discloses the device of claim 45, but does not expressly disclose each and every connection element as claimed. However, the claimed elements simply refer to a connection scheme that is well known in the art. It would have been obvious for one skilled in the art at the time of the invention to connect the gate wire and the data lines to external circuits for the purpose, for example, of executing the purpose of the device.

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5. Claims 12 and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaneko as applied to claims 11 and 52 above, and further in view of Mizuno et al. (U.S. Patent No. 6,266,110 B1).

In re claims 12 and 53, Kaneko discloses the devices of claims 11 and 52 respectively, but does not expressly disclose the aluminum containing wire containing AlSix. Mizuno discloses the use of Al-Si wiring layers. It would have been obvious to one skilled in the art at the time of the invention to use the Al-Si wiring layer as disclosed by Mizuno for the wiring layers of Kaneko for the purpose, for example, of enhancing the light-shielding of that region (Mizuno; column 1, lines 59-64).

6. Claims 14 and 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaneko as applied to claims 10 and 45 above, and further in view of Barth et al. (U.S. Patent No. 6,548,961 B2).

In re claims 14 and 48, Kaneko discloses the devices of claims 10 and 45 respectively, wherein the transparent conductive layer is indium tin oxide, but does not expressly disclose the use of indium zinc oxide. Barth disclose the use of indium zinc oxide as a transparent electrode (column 3, lines 45-50). Indium zinc oxide and indium tin oxide are well known replacements for each other in this art and it would have been obvious for one skilled in the art at the time of the invention to substitute like materials.

*Response to Arguments*


7. Applicant's arguments with respect to claims 10-15 and 45-50 have been considered but are moot in view of the new ground(s) of rejection.

*Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jesse A. Fenty whose telephone number is 571-272-1729. The examiner can normally be reached on 5/4-9 1st Fri. Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on 571-272-1664. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Jesse A. Fenty  
Examiner  
Art Unit 2815